

Sustainable Agriculture

Looking forward for this generation
and the next...

at **UGA**

Fall 2010

Last July we looked at profitability as one of the pillars of sustainable agriculture and talked about indicators for profitable farms that are sustainable. A second pillar of sustainable agriculture is minimizing the impact of agriculture on the environment, and these two pillars can have profound influences on each other.

Most of the farmers I know consider themselves stewards of their land. Many times their farm has been in the family for generations. Sometimes they have come back to farm based on an ideal or something instilled from a grandparent, a parent or another relative. But we also know some farming practices are not as environmentally friendly as we would like. Many national studies point to excess nitrogen or phosphorus fertilizer from farming contributing to hypoxia in the Gulf of Mexico or nutrient enrichment in the Chesapeake Bay. In Georgia, our number one stream impairment is due to sediment from erosion. Farming, as well as road building and other development, contributes to this. Some people worry about the presence of pesticide residues on our food and in our drinking water, and there have been cases where pesticide residues have been found in water or on food. Other groups worry that agriculture decreases biodiversity, and while there is truth in this, Georgia produces an amazing diversity of crops and has many areas with healthy riparian corridors along our farmland unlike some other areas of the US. This strength is something we will encourage and build upon.

Agriculture, including pastures and row crops, covers about 22% of landscape in Georgia and is

our number one economic sector, so agriculture has an enormous impact on both the economic and environmental well-being of the state. Although we need to continue to develop more sustainable practices, we know many ways to farm while protecting our natural resources. Practices such as crop rotation, utilizing cover crops, using organic fertilizers or soil amendments, reducing tillage, integrated pest management, biological pest management, nutrient management, fencing out stream corridors, and management intensive grazing are all tools in our sustainable agriculture toolbox.

So how do we know we are headed in the right direction? The indicators below give us questions to ask ourselves: Will this practice help prevent soil erosion on my farm? Does it encourage a diversity of plants and animals in the landscape? Because each farm is different, there is not one right answer. Because life is complex, there are nearly always tradeoffs. A vegetable grower might use plastic to reduce weeds and not use herbicides. This would minimize the use of toxic substances, but not minimize the dependence on non-renewable resources because plastics come from fossil fuels. There also can be tradeoffs between environmental stewardship and profitability. A farmer who fences out bottomland to protect stream water and provide wildlife habitat can lose the best land for grazing when conditions are dry.

For us to craft truly sustainable agriculture, we need to be cognizant of the complexity and tradeoffs, but continue to move toward our goal of environmental stewardship.

*Julia Gaskin
Sustainable Agriculture Coordinator, UGA-CAES*



Environmental Stewardship Indicators

- Builds and maintains soil organic carbon to level appropriate for soil and climate
- Prevents soil erosion
- Balances nutrient inputs and outputs
- Maintains clean water
- Maximizes water conservation
- Minimizes dependence on non-renewable resource fuels and products
- Minimizes use of toxic substances
- Uses integrated pest management practices
- Maximizes crop rotation
- Encourages diversity of plant varieties and/or livestock breeds
- Encourages diversity of plants and animals within the landscape
- Minimizes land under agricultural production
- Minimizes air pollution problems such as odors, dust, and greenhouse gasses
- Minimizes solid waste generation

Extension

Goat Extension Education to Meet an Evolving Demographic

Goats have become an increasingly important part of Georgia agriculture with an increase in goat numbers of 79% over the past decade. The increase in goat numbers has created a demand for better management skills to optimize inputs and profitability for goat producers. To meet this demand a six week Master Goat Farmer Education Program was created by County Extension Agents in seven Northeast Georgia counties.

The first course was held in Athens at the University of Georgia, which was a central location for producers in the seven-county area. Seventy-five participants, some from as far away as Coweta County, came each Tuesday night to

hear presentations and work through management problems.

Specialists from Fort Valley State University and the University of Georgia, industry representatives and County Extension Agents gave presentations on predator control, facilities, grazing, feeds and nutrition, as well as marketing and budgets. Participants were surprised to hear from Mr. Sidney Law, Washington County Extension, that worldwide, the largest market for goats is Asian including the Mideast. Here in Georgia, the best market for high quality animals is directly from the farm, but new farmers may have to sell their animals through the sales barn initially to build their reputation.

Dr. Will Getz of Fort Valley State University gave presentations on reproduction, kidding and breeds. A hands-on session in identifying diseases and parasites was conducted by Dr. Bob Storey, Infectious Diseases, UGA. This included training on how to use FAMACHA to know when goats need to be wormed.

Farmers were pleased with the course and test evaluations showed a substantial gain in knowledge. The course was so successful that the agents are planning to hold another one in the near future. For more information, contact Mr. Forrest Connelly, Stephens County Extension or Mr. Bob Waldorf, Banks County Extension.

Forrest Connelly, Stephens County Cooperative Extension



Bob Waldorf checks for internal parasite load using FAMACHA.

“Growing Local” Conference Held in Tifton

Over 50 growers, advocates, and researchers from as far west as Columbus and as far east as Cumberland Island gathered at the UGA Black Shank farm facility in Tifton Nov. 12-13 for the first South Georgia Growing Local Food Conference.

Intended to create a stronger network for local, sustainable food south of the Fall Line, the conference included a self-guided farm tour in the Tifton area, a potluck, a screening of “Fresh: New thinking about what we’re eating,” a full day of workshops, a local food lunch, and a facilitated dialogue on how to build the sustainable food movement in South Georgia.

“We were thrilled with the turn-out and enthusiasm at the conference,” said Leeann Culbreath, a conference organizer. “There is more going on in our area than we knew, and everyone is hungry for information on how to grow crops and grow the movement down here.” Workshops covered growing in the Coastal Plain, pests (with UGA Entomologist Dr. John Ruberson), small-scale poultry production, policy, farmers’ markets, farm-to-school, and homesteading how-to.

The farm tour included a stop at the UGA-Tifton organic research plots, led by Dr. Juan Carlos Diaz-Perez.

The conference was made possible through support from Georgia Organics, the Tifton-Tift County Tourism Association, and UGA CAES. The group formed a Facebook group called “Okraiores” after the conference and maintains a Google group with the same name for ongoing communication. Attendees indicated interest in twice-yearly conferences or workshops at different locations in South Georgia. The group

plans to meet next at the March 2011 Georgia Organics conference in Savannah.

Research

UGA Receives Grant to Study Increasing Locally Produced Meat

USDA recently announced 22 matching grants worth about \$1.3 million to support agricultural market research and demonstration projects, including how to market local beef and how to increase locally-produced beef, pork and poultry. Among the grants, \$63,275 went to the University of Georgia:



- to examine the market for locally-produced beef in the Southeastern U.S.
- to determine consumers’ willingness to pay for various product attributes to help retailers and foodservice operators better estimate consumer price-points
- to help producers implement appropriate production strategies.

Curt Lacy, clacy@uga.edu

Grower’s Corner

Soil Test to Manage and Build Soil Fertility

The University of Georgia does soil testing for growers that can help them manage their soils both in the short and long term. The routine soil test is the most commonly requested and generally the most useful to assess your soil. The cost is still only \$6.00. Sample bags and

instructions on how to collect samples can be obtained from your local county extension office. They can also help you interpret the results and make recommendations.

When submitting your sample, indicate which crop or crops you are growing to get specific recommendations for that crop. Also indicate if you wish to receive the new Factsheet for organic production. The fertility recommendations are for inorganic fertilizers, but the new Organic Production Factsheet points you to information on how to convert an inorganic fertilizer recommendation to an organic one (Extension Circular 853) and how to estimate how much nitrogen will be provided by a cover crop.

The routine test reports soil pH, plant available levels of phosphorus, potassium (potash), and several other macro and micro nutrients. Soil pH is an important factor affecting soil productivity. It's a good idea to have your pH tested every year and make adjustments as necessary. Most soils in Georgia are going to be acid or acid forming. This can be corrected with application of lime. This is, however, a relatively slow process so if you suspect a pH problem it should be checked and lime applied 2-3 months prior to planting.

Soil testing can also help you manage your land long term. If you are using items such as poultry litter, annual analysis can indicate potential problems that can arise from continued long term use of such products. Poultry litter, for example, can increase your phosphorus levels dramatically as well as increase your soil pH, which can cause problems with plant nutrition.

Most cultivated soils in Georgia are low in organic matter. If you are trying to manage your soil to improve organic matter levels over time with the addition of compost, crop rotations, and cover

crop green manures, soil testing can help here as well. An additional test should be conducted on your soil to determine the percent of organic matter. The soil test laboratory has such a test, which costs an additional \$8.00. This test can be very helpful to monitor your soil building efforts over time.

Soil testing also offers a commercial greenhouse or nursery soil test. This test would generally not be used with field soils; however, if you have a heavily amended soil, greater than 50% organic matter or have built raised beds, filled with an organic based media, this test may be helpful. Although more expensive than the other tests, at \$30.00, this test will give you information on soluble salts, ammonium and nitrate nitrogen,

phosphorus, potassium, and other nutrients as well as pH. There are no specific recommendations with this test, but your local county extension agent can help you determine if this test is appropriate for you before you test, and help interpret the result after testing.

You can make the best use of your soil tests by sampling at

the same time of year and collecting a soil sample that is characteristic of a particular area. You should collect a sample from fields, beds, or growing areas that are and have been under similar management and have a similar type of soil. Several subsamples in a particular area should be mixed together to form your sample. Row crops and vegetable samples should be collected from a depth of 0 to 6 inches. More information on how to take a proper soil sample can be found in Soil Testing for Home Lawns, Gardens and Wildlife Food Plots Extension Circular 896.

Fall is a good time to get this sampling done so you can be prepared for a new growing season.



So get those soil samples submitted, it's a key component of a sustainable growing system.

George Boyhan and Julia Gaskin

Crop Rotation and Sustainability

Early civilizations developed along rivers and alluvial plains because the land was periodically replenished when the river flooded the nearby fields. Because of this ongoing land replenishment, these fields could be used indefinitely. As people moved away from these areas, they quickly found that the land could not sustain continuous cropping. Crop rotation became an integral part of managing such land at that time and remains so today. Modern agriculture has overcome the need for rotation by continual addition of fertilizer and other agricultural chemicals. It is not, however, a sustainable practice.

Rotation then, is a core approach in enhancing and maintaining sustainability. Crop rotation offers many benefits including maintaining and improving soil fertility and managing many agricultural pests. A number of approaches are used with rotation. For example, legumes are an integral part of crop rotation because of the unique relationship legumes have with nitrogen fixing bacteria. These bacteria colonize the roots of legumes in root nodules. The atmospheric nitrogen these bacteria fix is utilized not only by the current legume crop, but also by the subsequent crop. This unique symbiotic relationship can be exploited by integrating legumes into rotations with other crops, particularly crops that are heavy feeders.

Certain grasses that are particularly deep rooted can be used in rotations to scavenge for nutrients that have leached into deeper parts of the soil.

Upcoming Events

January 6-9, 2011 - 2011 Southeast Regional Fruit & Vegetable Conference - Savannah International Trade and Convention Center - Sponsored by the Georgia Fruit and Vegetable Growers Association, this is the largest educational conference and trade show in the southeastern United States. For more information, visit www.gfvga.org. Organic Production sessions are on Friday.

January 19-22, 2011 - Southern SAWG 20th Annual Conference - Chattanooga Convention Center - Chattanooga, Tennessee. The general conference, to be held on Friday and Saturday, offers 56 one and a half hour sessions on a broad range of topics including sustainable production and marketing information, enterprise management lessons, farm policy education and community food systems development information. See www.ssawg.org for complete information.

March 5-6, 2011, Saturday & Sunday - Organic Grower's School Annual Spring Conference - University of North Carolina, Asheville - Save the date and monitor www.organicgrowersschool.org for further details on this popular conference. Over 70 classes and hands-on workshops on a variety of topics will make this a great weekend of learning and networking.

March 10, 2011 – The Georgia Center for Aquaculture Development at FVSU has announced its 2011 workshop calendar. The next workshop will be **Water Quality and Fish Health Maintenance in Aquaculture Production Systems**. Please contact **Dr. Pat Duncan**, duncanp@fvsu.edu 478-825-6575 for more information on this or future workshops.

March 11-12, 2011 - Mark your calendars now for the **2011 Georgia Organics Annual Conference**, Savannah. Monitor www.georgiaorganics.org for more details.

These grasses can draw nutrients from deep in the soil and incorporate them into their biomass. As these grasses break down at the surface, these nutrients become available to subsequent crops.



Several general concepts are recommended in crop rotation. For example, rotations should occur across plant families. Plants in the cucurbit family such as cucumbers, squash, watermelon, or cantaloupe should not be planted after each other in rotation. Plants from other families such as alliums, brassicas, or legumes should be included in the rotation.

Rotation can also be useful in controlling diseases and pests, particularly soil borne pests such as nematodes. Rotations that include non-hosts can be very effective at reducing nematode populations. Not all diseases are effectively controlled by rotation, however. This would include such diseases as southern blight and Fusarium wilt, which can produce relatively long lived reproductive structures.

Crop rotation is a requirement in the USDA's National Organic Program certification. There has been some confusion about what exactly crop rotation is, particularly in the south where mild weather means essentially a year round growing season. Planting a spring crop of squash followed by a different summer crop such as green beans, which then has the same squash crop planted the following spring is not a rotation. The squash/green bean planting is called double cropping. A rotation requires a different crop over years not seasons. In fact, even though technically a two-year rotation is acceptable under the NOP rules, for a rotation to be effective a minimum of three years is needed. In fact, many rotation schemes have been devised that involve many crops over many years.

Vidalia onions have become an important organically produced crop in Georgia and many organic growers outside the Vidalia region also grow onions. We are currently investigating

rotations with onions that include other high value winter vegetables to develop a profitable cool-season vegetable rotation. This three year study is examining onion production in rotation with other cool season crops such as carrots, broccoli, potatoes, snap peas, and lettuce. The rotations include cover crops such as oats/Austrian winter peas and sudan/sorghum to retain nutrients, build the soil and help mitigate pests. This study will examine soil diseases, soil fertility, crop yield, and quality. It is hoped that this study will help larger growers use rotation while still maintaining high profits.

Crop rotation will not solve all nutrient and disease problems. Each situation is unique and will have to be assessed individually to maximize benefits from crop rotation. An excellent resource to help in planning crop rotations is 'Crop Rotation on Organic Farms, A Planning Manual' edited by Charles Mohler and Sue Ellen Johnson. This publication is available for purchase from the Natural Resources, Agriculture, and Engineering Service at their website at: www.nraes.org, or may be downloaded free from SARE at www.SARE.org (see publications/handbooks). Also, be sure to check the Resources section of the UGA-CAES sustainable agriculture website, www.SustainAgGa.org

Dr. George Boyhan, Extension Vegetable Specialist
gboyhan@uga.edu

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